

## London Mine Tailings Reclamation Project Park County, Colorado

### Background

The historic London Mine is located in the headwaters of South Mosquito Creek, approximately four miles west of the Town of Alma in Park County. Mining and milling operations have been intermittently active at the London Mine since 1874. The site contains three mill tailings piles and a number of waste rock piles that are immediately adjacent to South Mosquito Creek. The tailings continually leach acidic, metal-laden water into the perennial stream. In the spring, the creek significantly erodes the tailings piles and contributes metal-laden sediment to the creek.

In the early 1980s, Mined Land Reclamation Permit M-1980-250 was issued for modern mining and milling operations at the London. In 1997, at the request of the London Mine Limited Liability Company, the Colorado Mined Land Reclamation Board revoked the permit and forfeited the \$12,000 reclamation bond. The bond funds were used to partially stabilize portions of the tailings, but were grossly insufficient to complete reclamation of the overall site to applicable performance standards.

The project funding was through a generous donation from Freeport McMoRan Copper and Gold Inc., and grants from the Colorado Water Resources and Power Development Authority and Colorado Department of Public Health and Environment, as well as severance tax funds directed to under bonded permit revocation sites.

### Project Site Characterization

In 2011 and 2012, the Division of Reclamation Mining and Safety (DRMS) measured surface water flows and collected water and tailings samples from the London Mine site. A portable X-ray Fluorescence (XRF) device was used to measure total metal concentrations in the historic deposits, the tailings impoundment known as the Elephant Trap and the nearby Butte Mine. The results of the water sample analyses showed elevated levels of zinc and lead. The XRF and laboratory testing of the tailings confirmed the presence of heavy metals.



*Top: View to the East of Tailings before and following removal  
Bottom: Water Sampling with Environmental Learning for Kids (ELK)*

#### Land Owner

Estate of Benjamin Wright, Jr.

#### General Contractor

McCollum's Excavating, LLC  
PO Box 790  
Nederland, CO 80466

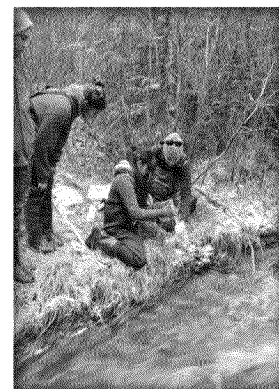
**Total Project Cost: \$819,317.92**

#### DRMS Project Managers

Allen Sorenson 303-866-3567 ext. 814  
Erica Crosby ext. 8115



**COLORADO**  
Division of Reclamation,  
Mining and Safety  
Department of Natural Resources



## London Mine Tailings Reclamation Project, Final

### Work Description

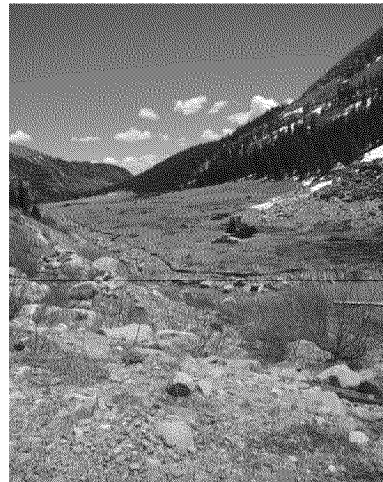
Contractor mobilization and site preparation began in August of 2013. Tailings material was removed down to creek level, a removal depth of approximately three to five feet. Excavated tailings were placed in the Elephant Trap and in the consolidation area. Geogrid and geotextile were placed over soft subgrade prior to placement of backfill. Backfilled material came from the consolidation area, limited material from the tailings impoundment and a borrow source north of the creek.

As tailings removal reached final grade, the area was simultaneously backfilled with clean borrow material. Tailings were eventually removed from the right bank of South Mosquito Creek and the streambank was reconstructed with rock and clean fill material. An under-drain was installed to capture and route up-gradient ground water away from the tailings consolidation area.

The total area reclaimed upon final completion is 8.5 acres. The work included excavating over 80,000 cubic yards of tailings, which were placed in the consolidation area. More than 32,000 cubic yards of raw clean fill was excavated and used to cover the reclamation area, including 11,330 cubic yards of clean fill screened and placed and 4,000 cubic yards of rock generated by screening and selective excavation used for armoring channels and stream bank reconstruction.

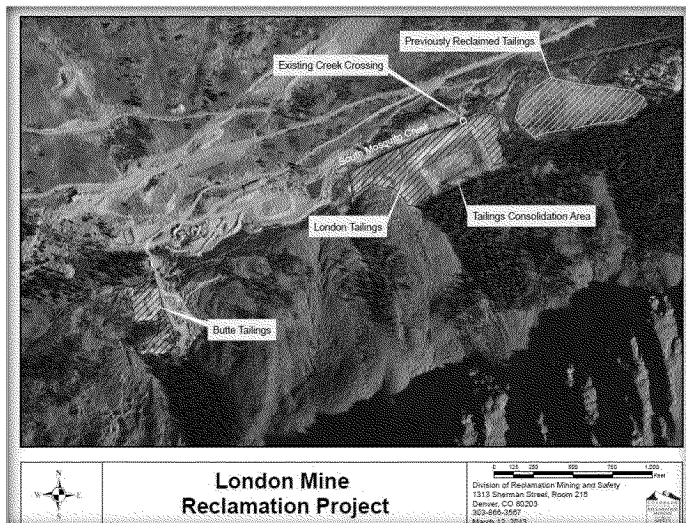


*Above: Material removed from the historic London tailings area and geosynthetics placed over soft subgrade then covered with clean backfill.*



*Left: Equipment incorporating the composted biosolids into the backfill material followed by seeding and mulching.*

In the Spring of 2014, 1,000 cubic yards of composted biosolids (donated by Freeport McMoRan) and 400 cubic yards of compost from the Summit County landfill were incorporated into the backfill area. The area was revegetated with a subalpine seed mixture.



*Left: Aerial Map of London Project Area*

*Right: Sign noting the partners that contributed to the London Mine Tailings Reclamation Project*

